# SAS to SAS/SATA II JBOD Subsystem

# User Manual

**Revision 1.0**

# Table of Contents

**Chapter 1 Introduction ..... 3**
1.1 Features ..... 4
1.2 Technical Specifications ..... 5
1.3 Unpacking the JBOD Subsystem ..... 6
1.4 Identifying Parts of the JBOD Subsystem ..... 7
1.4.1 Front View ..... 7
1.4.2 Rear View ..... 8
1.4.3 JBOD Controller Module ..... 9
1.4.3.1 JBOD Controller Panel ..... 10
1.5 Power Supply Fan Module (PSFM) ..... 11
1.5.1 PSFM Panel ..... 11
1.6 LCD Display Panel ..... 13
1.6.1 LCD Panel LED ..... 13
1.6.2 LCD Panel Function Buttons ..... 14
1.7 Drive Carrier Module ..... 15
1.7.1 Disk Drive Status Indicators ..... 15
1.7.2 Drive Carrier Lock Indicator ..... 16
**Chapter 2 Installation of JBOD Subsystem ..... 17**
2.1 Powering On ..... 17
2.2 Disk Drive Installation ..... 18
2.2.1 Installing a SAS Disk Drive in a Disk Tray ..... 18
2.2.2 Installing a SATA Disk Drive (Dual Controller Mode) in a Disk Tray ..... 20
2.3 Connecting the JBOD Subsystem ..... 22
2.3.1 Connecting to SAS HBA ..... 22
2.3.2 Connecting to RAID Subsystem ..... 22
**Chapter 3 Maintenance ..... 23**
3.1 Upgrading Firmware ..... 23
3.2 Replacing JBOD Subsystem Components ..... 25
3.2.1 Replacing JBOD Controller Module ..... 25
3.2.2 Replacing Power Supply Fan Module ..... 26
3.2.2.1 Replacing Power Supply Fan Module with Plate Cover ..... 27

# Chapter 1 Introduction

**The 16 bays EPICa JBOD Subsystem**

The EPICa EP-3163J/JD-S3S3 is a 19-inch 3U rackmount JBOD unit. It comes with 16 hot-swappable bays and is the Proware's most versatile SAS/SATA II Disk Expansion system, ideal for high capacity and scalability storage in most popular OS environments. Based on 3Gb SAS Channel host interfaces, the EP-3163J/JD-S3S3 supporting the choice of SAS and SATA II drive configurations to deliver the best cost-performance index with higher bandwidth.

The ability to mix SAS and SATA drives allows the EP-3163J/JD-S3S3 to be used for a range of applications that require different price/performance characteristics. Cost-effective SATA drives can be selected for capacity orientated storage such as disk-to-disk backup and the storage of reference data. Higher specification SAS drives can be employed for I/O intensive applications including transactional databases. Hosting multiple tiers of data in an EP-3163J/JD-S3S3 configuration gives organizations the flexibility to meet both their technical requirements and budgetary constraints with a single unified solution.

## 1.1 Features

- 16 hot-swappable drive bays in a rackmount 3U chassis
- Simultaneously support SAS or SATA disk
- Single or dual SAS JBOD controller module
- Each SAS JBOD controller module has three mini SAS (4X) ports
- Power Supply and cooling system contained in 1 module for efficient cooling
- Two 500W redundant hot swappable power supplies
- Incorporates a cableless design for maximum signal integrity
- Utilizes industry-standard SCSI Enclosure Services to monitor enclosure and disk environmental conditions

## 1.2 Technical Specifications

| **Model** | **EP-3163J-S3S3 / EP-3163JD-S3S3** |
|---|---|
| **RAID Controller** | JBOD |
| **Controller** | Single / Redundant |
| **Host Interface** | One / Two 4x mini SAS (3Gb/s) |
| **Disk Interface** | SAS 3Gb or SATA II |
| **SAS expansion** | Two / Four 4x mini SAS (3Gb/s) |
| **Capacity** | |
| **- Direct Attached** | 16 Disks |
| **- Expansion** | Please refer to RAID controller specification |
| **Monitor Port support** | Yes |
| **Enclosure** | |
| **Platform** | Rackmount |
| **Form Factor** | 3U |
| **# of Hot Swap Trays** | 16 |
| **Tray Lock** | Yes |
| **Disk Status Indicator** | Access / Fail LED / Power LED |
| **Backplane** | SAS / SATA II Single BP |
| **# of PS/Fan Modules** | 500W x 2 w/PFC |
| **# of Fans** | 4 |
| **Power requirements** | AC 90V ~ 264V Full Range, 10A ~ 5A, 47Hz ~ 63Hz |
| **Environmental** | |
| **Relative Humidity** | 10% ~ 85% Non-condensing |
| **Operating Temperature** | 10°C ~ 40°C (50°F ~ 104°F) |
| **Physical Dimension** | 590(L) x 482 (W) x 131(H) mm |
| **Weight** | 24 / 25 Kg (Without Disk) |

## 1.3 Unpacking the JBOD Subsystem

The shipping package contains the following:

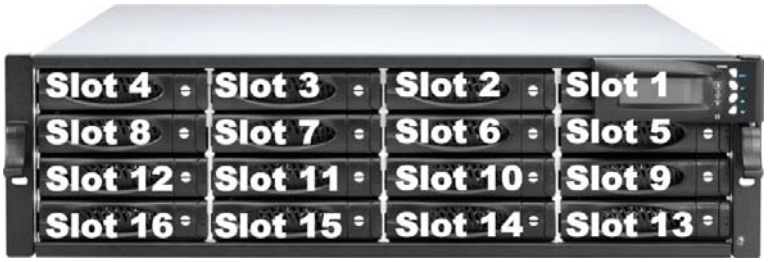
| | |
|---|---|
| | JBOD Subsystem Unit |
| | Two (2) power cords |
| | One serial cable (RJ11 to DB9)<br><br>Note: Two serial cables for dual JBOD controllers |
| | One external Mini SAS cable SFF-8088 to SFF-8088<br><br>Note: Two mini SAS cables for dual JBOD controllers |
| | One(1) JBOD Module Plate Cover<br><br>NOTE: For Dual JBOD Controller |
| | One(1) PSFM Plate Cover |
| | User Manual |

**NOTE: If any damage is found, contact the dealer or vendor for assistance.**

## 1.4 Identifying Parts of the JBOD Subsystem

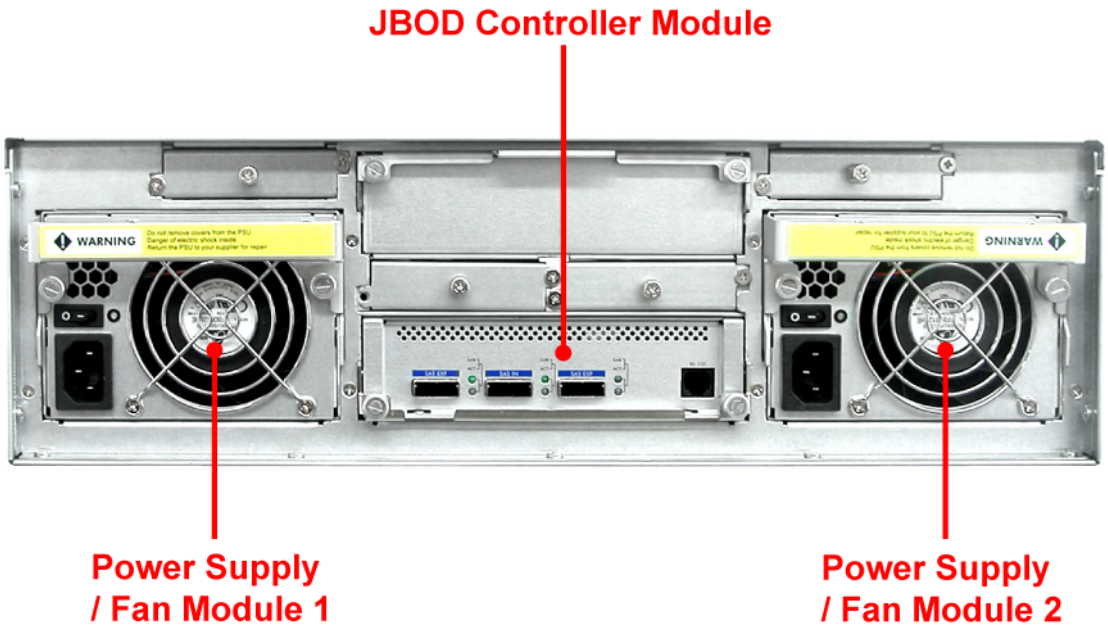
The illustrations below identify the various parts of the expansion chassis.

### 1.4.1 Front View

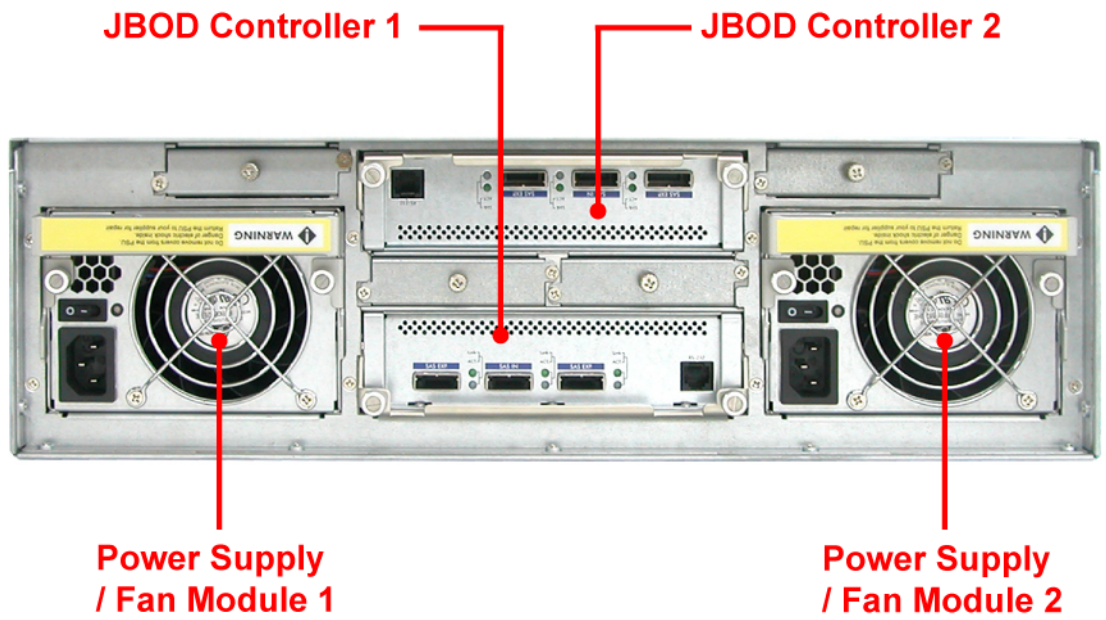


### 1.4.2 Rear View

**Single JBOD Controller**




**Dual JBOD Controller**

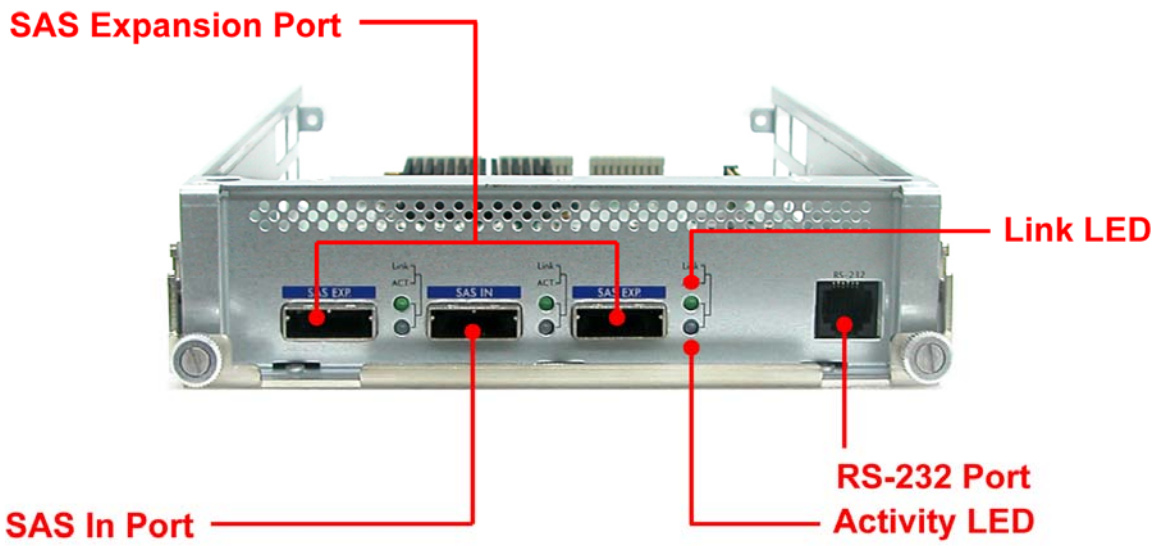


### 1.4.3 JBOD Controller Module

The EPICa JBOD subsystem includes a single or dual 3Gb SAS-to-SAS/SATA II JBOD Controller Module.

**JBOD Controller Module**

### 1.4.3.1 JBOD Controller Panel




| Part | Description |
|---|---|
| SAS In Port | Use to connect to SAS HBA or to RAID subsystem's SAS Expansion Port. |
| SAS Expansion Port | Use to connect to the SAS In Port of another JBOD subsystem. |
| RS-232 Port | Use to upgrade the firmware of the JBOD controller. Connect the RJ11-to-DB9 serial cable to your system's serial port. |

| Indicator | Color | Description |
|---|---|---|
| Link LED | Green | Indicates expander has connected or linked. |
| Activity LED | Blinking Blue | Indicates the expander is busy and being accessed. |

## 1.5 Power Supply Fan Module (PSFM)

The EPICa JBOD subsystem contains **two 500W Power Supply / Fan Modules**. All PSFMs are inserted into the rear of the chassis.

### 1.5.1 PSFM Panel

WARNING
Do not remove covers from the PSU.
Danger of electric shock inside.
Return the PSU to your supplier for repair
Power On/Fail Indicator
Power On/Off Switch
AC Power Inlet Plug (Male)

The panel of the Power Supply/Fan Module contains: the Power On/Off Switch, the AC Inlet Plug, and a Power On/Fail Indicator showing the Power Status LED, indicating ready or fail.

Each fan within a PSFM is powered independently of the power supply within the same PSFM. So if the power supply of a PSFM fails, the fan associated with that PSFM will continue to operate and cool the enclosure.

When the power cord connected from main power source is inserted to the AC Power Inlet, the power status LED becomes RED. When the switch of the PSFM is turned on, the LED will turn GREEN. When the Power On/Fail LED is GREEN, the PSFM is functioning normally.

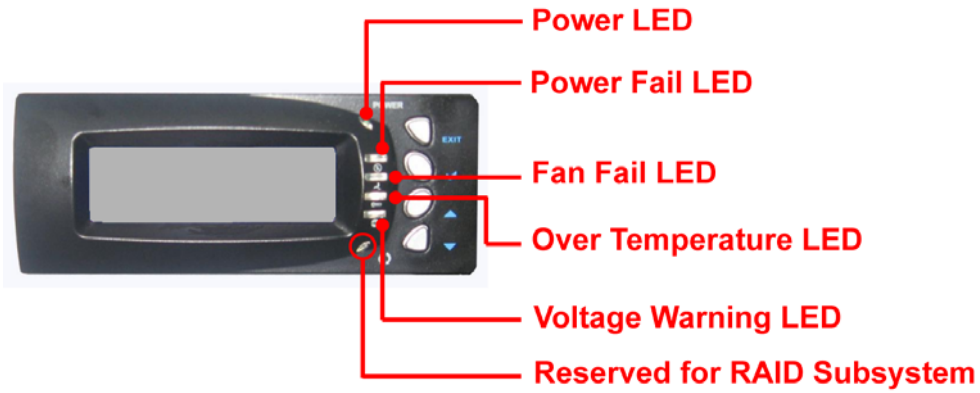
**NOTE: Each PSFM has one Power Supply and two Fans. PSFM 1 has Power#1 and Fan#1 and Fan#2. The PSFM 2 has Power#2 and Fan#3 and Fan#4. When the Power Supply of a PSFM fails, the PSFM need not be removed from the slot if replacement is not yet available. The fan will still work and provide necessary airflow inside the enclosure.**

**In replacing the failed PSFM, refer to section 3.2.2 of this manual.**

**NOTE: After replacing the Power Supply Fan Module and turning on the Power On/Off Switch of the PSFM, the Power Supply will not power on immediately. The Fans in the PSFM will spin-up until the RPM becomes stable. When Fan RPM is already stable, the RAID controller will then power on the Power Supply. This process takes more or less 30 seconds. This safety measure helps prevent possible Power Supply overheating when the Fans cannot work.**

## 1.6 LCD Display Panel

### 1.6.1 LCD Panel LED




| Parts | Function |
|---|---|
| Power LED | Green indicates power is ON. |
| Power Fail LED | If one of the redundant power supply unit fails, this LED will turn to RED and alarm will sound. |
| Fan Fail LED | Turn RED when fan 1 or 2 fails, or speed is lower than 500 RPM. |
| Over Temperature LED | If disk temperatures exceed 60°C, the Over Temperature LED will turn RED and alarm will sound. |
| Voltage Warning LED | An alarm will sound if detected voltage in the controller is abnormal and LED will turn RED. |

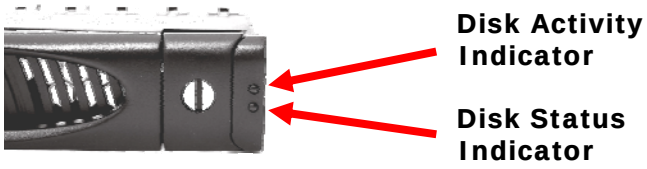
### 1.6.2 LCD Panel Function Buttons

| Parts | | Function |
|---|---|---|
| Up and Down Arrow buttons | ▲ ▼ | Use the Up or Down arrow keys to go through the information on the LCD screen. This is also used to move between each menu. |
| Select button | ✔ | This is used to enter the option you have selected. |
| Exit button | EXIT | Press this button to return to the previous menu. |

## 1.7 Drive Carrier Module

The Drive Carrier Module houses a 3.5 inch hard disk drive. It is designed for maximum airflow and incorporates a carrier locking mechanism to prevent unauthorized access to the HDD.

### 1.7.1 Disk Drive Status Indicators




| Part | Function |
|---|---|
| Disk Activity Indicator | This LED will blink blue when the hard drive is being accessed. |
| Disk Status Indicator | Green LED indicates power is on and hard drive status is good for this slot. If there is no hard drive, the LED is Red. The fault indicator depends on the RAID card or RAID Controller definition. |

## 1.7 Drive Carrier Module

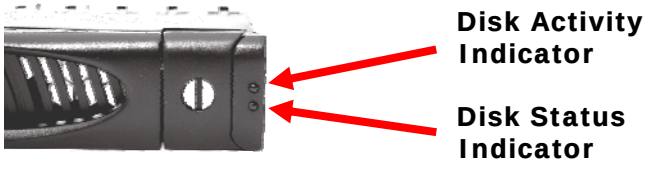
The Drive Carrier Module houses a 3.5 inch hard disk drive. It is designed for maximum airflow and incorporates a carrier locking mechanism to prevent unauthorized access to the HDD.

### 1.7.1 Disk Drive Status Indicators

Every Drive Carrier has 2 status indicator lights. One indicator light is used for Power On/Error (Disk Status Indicator). When this light is **GREEN** the power is on and everything is functioning normally. When the Power On/Error light is **RED**, then an error has happened that requires the user's attention.

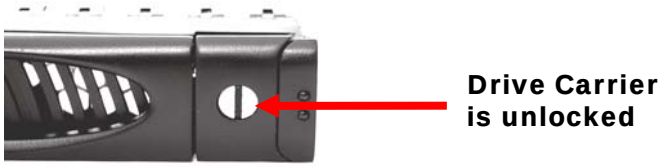
The other status indicator light is the hard disk drive access light (Disk Activity Indicator). When the hard disk drive is being accessed, this light will flash **BLUE**.

In addition, both indicator lights are viewable within a 170° arc.

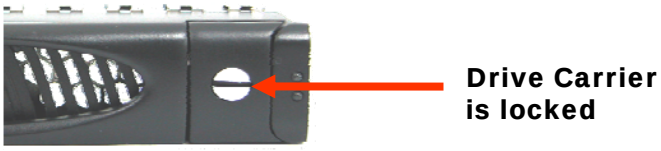


### 1.7.2 Drive Carrier Lock Indicator

Every Drive Carrier is lockable and is fitted with a lock indicator to indicate whether or not the carrier is locked into the chassis or not. Each carrier is also fitted with an ergonomic handle for easy carrier removal.




When the Lock Groove is vertical, then the Drive Carrier is unlocked.



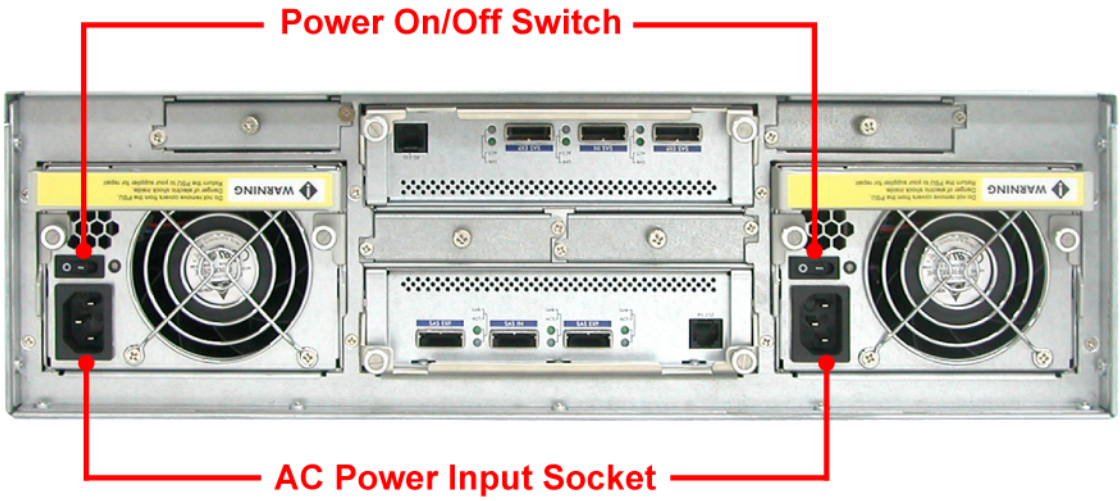

When the Lock Groove is horizontal, this indicates that the Drive Carrier is locked.

Lock and unlock the Drive Carriers by using a flat-head screw driver.

# Chapter 2 Installation of JBOD Subsystem

## 2.1 Powering On

1. Plug in the power cords into the AC Power Input Socket located at the rear of the subsystem.




**NOTE: The subsystem is equipped with redundant, full range power supplies with PFC (power factor correction). The system will automatically select voltage.**

2. Turn on each Power On/Off Switch to power on the subsystem.
3. The Power LED on the front panel will turn green.

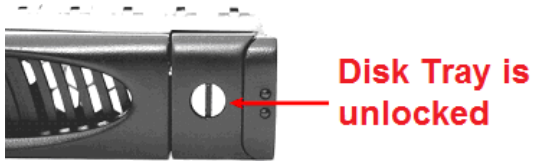
## 2.2 Disk Drive Installation

This section describes the physical locations of the hard drives supported by the subsystem and give instructions on installing a hard drive. The subsystem supports hot-swapping allowing you to install or replace a hard drive while the subsystem is running.

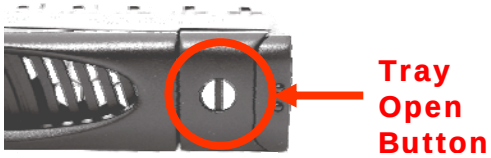
### 2.2.1 Installing a SAS Disk Drive in a Disk Tray

**NOTE: These steps are the same when installing SATA disk drive in Single Controller Mode.**

1. Unlock the Disk Trays using a flat-head screw driver by rotating the Lock Groove.



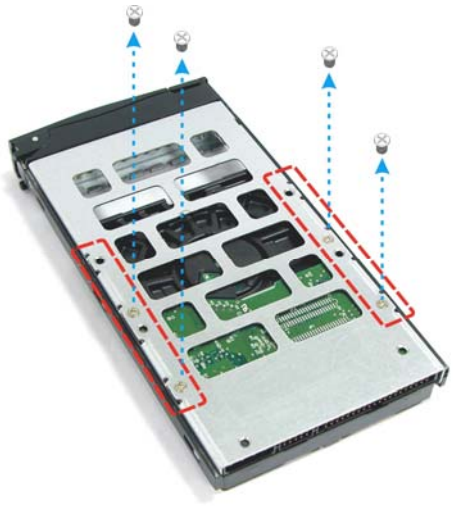

2. Press the Tray Open button and the Disk Tray handle will flip open.




3. Pull out an empty disk tray. Pull the handle outwards to remove the tray from the enclosure.

4. Place the hard drive in the disk tray. Make sure the holes of the disk tray align with the holes of the hard drive.

5. Install the mounting screws on the bottom part to secure the drive in the disk tray.



6. Slide the tray into a slot.

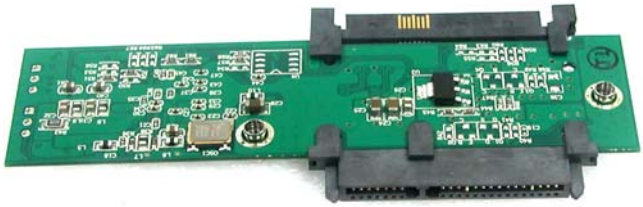
7. Press the lever in until you hear the latch click into place. The HDD Fault LED will turn green when the subsystem is powered on and HDD is good.

8. If necessary, lock the Disk Tray by turning the Lock Groove.

### 2.2.2 Installing a SATA Disk Drive (Dual JBOD Mode) in a Disk Tray

1. Remove an empty disk tray from the subsystem.

2. Prepare the dongle board and two screws.



3. Place the dongle board in the disk tray. Turn the tray upside down. Tighten two screws to secure the dongle board into the disk tray.

4. Place the SATA disk drive into the disk tray. Slide the disk drive towards the dongle board.

5. Turn the disk tray upside down. To secure the disk drive into the disk tray, tighten four screws on the holes of the disk tray. Note in the picture below where the screws should be place in the disk try holes.

6. Insert the disk tray into the subsystem.

## 2.3 Connecting the JBOD Subsystem

### 2.3.1 Connecting to SAS HBA

The Enclosure supports SAS interface which provides fast 300MB data transfer rate using SAS phy. The package comes with one SAS cable for single JBOD controller module, or two SAS cables for redundant JBOD controller modules.

Attach one end of the SAS cable to the SAS IN Port and the other end to the host bus adapter's (HBA) external SAS connector or to the SAS Switch. (The host bus adapter is installed in your Host computer system.)

### 2.3.2 Connecting to RAID Subsystem

Attach one end of the SAS cable to the SAS IN Port of the JBOD controller module and the other end to the SAS Expansion Port on the RAID controller of RAID subsystem. If configured in redundant mode, connect the other SAS cable to the SAS IN Port of the other JBOD controller, and the other end to the SAS Expansion Port on the other RAID controller of RAID subsystem.

# Chapter 3 Maintenance

## 3.1 Upgrading Firmware

### Upgrading Firmware Trough Terminal

**NOTE: It is important to stop I/O access to JBOD subsystem during firmware upgrade.**

**NOTE: Upgrading the firmware must be done from Master JBOD Controller if the JBOD Subsystem has redundant JBOD Controllers.**

1. Please use the null modem cable (RJ11 to DB9) and to connect JBOD Monitor Port and PC COM1 Port (or change to other COM Port as necessary).
2. Open Windows HyperTerminal Program. Connect using COM1 (COM Port used in Step1), Baud Rate: 115200, n, 8, 1, Flow Control: None.
3. Press the Enter key and the password prompt will be displayed.
4. Key in the password (Default password: 00000000) to login to CLI.
5. At CLI prompt, input the command to update firmware.
    a. CLI> **er dat1**
    b. CLI> **er code**

    **NOTE:**
    **"er code" is the command to erase flash firmware code.**
    **"er dat1" is the command to erase CFG data code.**
    **"fl code" is the command to update flash firmware code (.bin file).**
    **"fl dat1" is the command to update CFG data code (.rom file)**
    **Make sure you have both files before updating.**

    c. CLI> **fl dat1**
    d. Select Function menu to transfer CFG data .rom file: "Function" ➔ "Transfer" ➔ "Send File" ➔ "Browse" ➔ "Open" and select the .rom file (for example: **8010-mfgdat1-090608)** firmware folder location. Select "1K Xmodem" Protocol to send firmware file (**Only need about 15 seconds to finish sending firmware file. If not, please repeat steps C and D again**).
    e. CLI>**fl code**
    f. Select Function menu to transfer firmware file: "Function" ➔ "Transfer" ➔ "Send File" ➔ "Browse" ➔ "Open" and select the .bin file (for example: **8010-05.63.1.32-090526.bin)** from firmware folder

location. Select “1K Xmodem” Protocol to send firmware file (**Only need about 15 seconds to finish sending firmware file. If not, please repeat steps E and F again**).

**NOTE: If the JBOD Subsystem has redundant JBOD Controllers, remove the serial cable (RJ11 to DB9) from RS232 Port of JBOD Controller 1 and insert in the RS232 Port of JBOD Controller 2, and then repeat steps 3 to 6 to upgrade JBOD Controller 2. After upgrading both controllers, power cycle the JBOD Subsystem. Then login to CLI to verify JBOD firmware version.**

**NOTE: If JBOD Subsystem has single JBOD Controller, you can use the “xr” command to restart the JBOD Controller without needing to power cycle.**

g. Re-login to JBOD CLI.

h. Use “sy” command to verify JBOD firmware version.

CLI>**sy**

i. If needed, the “xr” command can also be used to restart the JBOD controller. (Normally used in single JBOD Controller mode)

CLI>**xr**

## 3.2 Replacing JBOD Subsystem Components

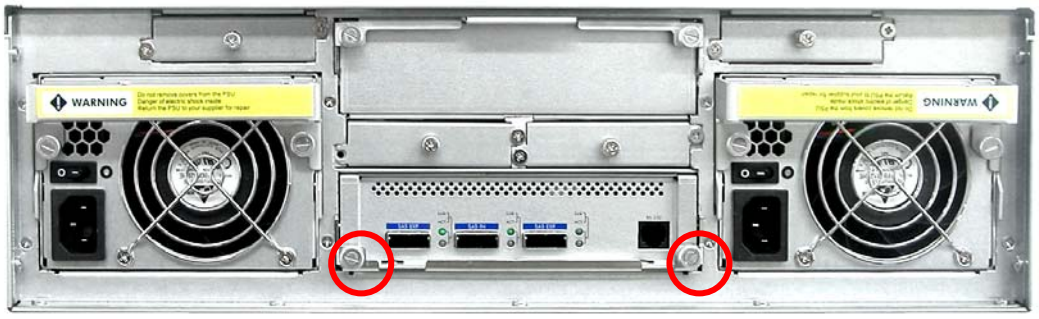
### 3.2.1 Replacing JBOD Controller Module

When replacing a failed JBOD Controller Module, please follow these steps:

1. Loosen the thumbscrews on the sides of the JBOD Controller Module drawer.
2. Use the Controller handle to pull out the defective JBOD Controller Module drawer.
3. Insert and slide the new JBOD Controller Module in. Note that it may be necessary to remove the old/defective JBOD Controller Module from the drawer case and install the new one.

**IMPORTANT: When replacing a failed component online, it is not recommended to remove the failed component for a long period of time; proper air flow within the enclosure might fail causing high controller/disk drive temperature.**

4. Tighten the thumbscrews on the sides of the JBOD Controller Module case.



### 3.2.2 Replacing Power Supply Fan Module

When replacing a failed power supply fan module (PSFM), please follow these steps:

1. Turn off the Power On/Off Switch of the failed PSFM.
2. Disconnect the power cord from the AC Inlet Plug of PSFM.
3. Loosen thumbscrews of the PSFM.
4. Use the handle to pull out the defective PSFM.
5. Before inserting the new PSFM, make sure the Power On/Off Switch is on "Off" state.
6. Insert and slide the new PSFM in until it clicks into place.

**IMPORTANT: When the subsystem is online and a Power Supply fails, and the replacement Power Supply module is not yet available, the failed Power Supply Module can be replaced with the Plate Cover. This is to maintain proper airflow within the enclosure. (Refer to next section)**

**When replacing a failed component online, it is not recommended to remove the failed component for a long period of time; proper air flow within the enclosure might fail causing high controller/disk drive temperature.**

7. Connect the power cord to the AC Inlet Plug of PSFM.
8. Tighten the thumbscrews of the PSFM.
9. Turn on the Power On/Off Switch of the PSFM.

**NOTE: After replacing the Power Supply Fan Module and turning on the Power On/Off Switch of the PSFM, the Power Supply will not power on immediately. The Fans in the PSFM will spin-up until the RPM becomes stable. When Fan RPM is already stable, the RAID controller will then power on the Power Supply. This process takes more or less 30 seconds. This safety measure helps prevent possible Power Supply overheating when the Fans cannot work.**

### 3.2.2.1 Replacing Power Supply Fan Module with Plate Cover

When replacing a failed power supply fan module (PSFM) with Plate Cover, please follow these steps:

1. Turn off the Power On/Off Switch of the failed PSFM.
2. Disconnect the power cord from the AC Inlet Plug of PSFM.
3. Loosen thumbscrews of the failed PSFM.
4. Pull out the defective PSFM.
5. Insert the PSFM Plate Cover carefully.